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PB-260 218

RADIUM MONITORING NETWORK

DATA RELEASE NUMBER 3

PUBLIC HEALTH SERVICE, DENVER, COLORADO

JULY 1963

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PB 260 218

RADIUM MONITORING NETWORK

Data Release No. 3

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Bureau of State Services
Division of Water Supply and Pollution Control
Region VIII
Denver, Colorado

Colorado River Basin Water Quality Control Project

July 1963

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15. Supplementary Notes

Report on Colorado River Basin Water Quality Control Project.

16. Abstracts

This third data release report contains available radium-226 and uranium results supplementing data contained in the previous releases of October 1962 and January 1963. The data indicate evidence of uranium mining and milling from analysis of composite water samples at stations of the Radium Monitoring Network established by the Colorado River Basin Water Quality Control Project. The network is a surveillance system consisting of continuous surface water sampling at 23 significant locations throughout the basin. It assays the radiological content of river water over the entire basin. Tabular data are offered.

17. Key Words and Document Analysis. 17a. Descriptors

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*Water quality data
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Tables (Data)
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COLORADO RIVER BASIN WATER QUALITY CONTROL PROJECT

RADIUM MONITORING NETWORK

Introduction

This is the third release of data collected through the Radium Monitoring Network of the Colorado River Basin Water Quality Control Project of the U. S. Public Health Service, U. S. Department of Health, Education, and Welfare. This release is to supplement the data contained in the two previous releases of October 1962 and January 1963 and to provide further insight into the significance of that data.

In this release radium-226 analyses are presented that have been obtained subsequent to Data Release No. 2. In addition, uranium analysis at all stations was begun in approximately October 1962 and is reported herein.

Figure 1 shows the location of active Radium Monitoring Network (RMN) stations and their relative location with respect to uranium mills in the Colorado River Basin.

When viewed as a whole, all of the reported data for dissolved radium-226 are as follows:

Average Ra-226	0.36 μμc/l
Range	0.0 to 4.8 μμc/l
Number of analyses	548

All data from background stations (unaffected by uranium mining and milling activities) grouped together are as follows:

Average Ra-226	0.08 μμc/l
Range	0.0 to 0.68 μμc/l
Number of analyses	96

The data from all non-background stations show:

Average Ra-226	0.42 μμc/l
Range	0.01 to 4.8 μμc/l
Number of analyses	452

Dissolved uranium results when viewed as a whole are as follows:

Average uranium	11 μg/l
Range	0.2 to 150 μg/l
Number of analyses	223

All data from background stations yeild the following uranium results:

Average uranium	2.5 μg/l
Range	0.6 to 5.5 μg/l
Number of analyses	29

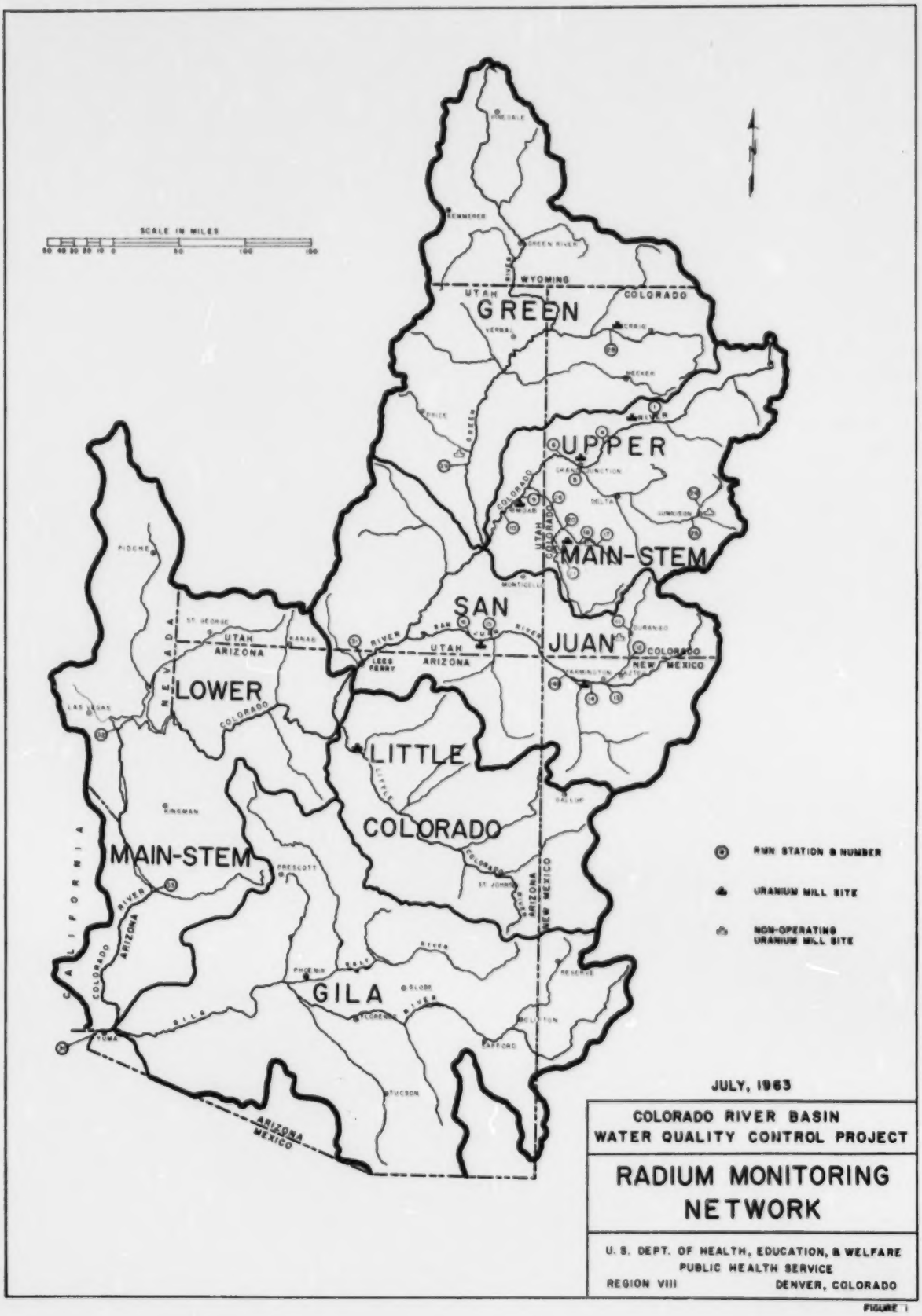
SCALE IN MILES
50 40 30 20 10 0 50 100 150
N
WYOMING
UTAH
COLORADO
GREEN
UPPER
COLORADO
MAIN-STEM
SAN
JUAN
UTAH
ARIZONA
NEW MEXICO
COLORADO
LOWER
COLORADO
MAIN-STEM
LITTLE
COLORADO
GILA
NEVADA
CALIFORNIA
ARIZONA
NEW MEXICO
RUN STATION & NUMBER
URANIUM MILL SITE
NON-OPERATING URANIUM MILL SITE
JULY, 1963
COLORADO RIVER BASIN
WATER QUALITY CONTROL PROJECT
RADIUM MONITORING NETWORK
U. S. DEPT. OF HEALTH, EDUCATION, & WELFARE
PUBLIC HEALTH SERVICE
REGION VIII
DENVER, COLORADO

FIGURE 1

The data from all non-background stations are as follows for uranium:

Average uranium	13 µg/l
Range	0.2 to 150 µg/l
Number of analyses	194

Many of the stations in the Radium Monitoring Network have been in operation continuously for a sufficient period of time to provide a full year of data. Following are plots of some of these stations. Stations that are on the same stream are included on the same graph to illustrate differences between the two points. Average monthly radium-226 concentration in µµc/l is shown on the ordinate on logarithmic scale with time in months plotted on the arithmetic abscissa.[1]

Figure 2 is a graph of results from RMN 17, 18, and 20, on the San Miguel River. They are the San Miguel River above Naturita, Colorado, the San Miguel River above Uravan, Colorado, and the San Miguel River below Uravan, Colorado, respectively. There is no uranium mining or milling above RMN 17, and it is considered a background station. The now-closed uranium mill of the Vanadium Corporation of America (VCA) is located below Naturita and between RMN 17 and RMN 18. The Uravan uranium mill of Union Carbide Nuclear Corporation is located at Uravan, Colorado and is between RMN 18 and RMN 20.

The VCA mill was in operation as an ore upgrader from approximately November 1961 to March 1963 which covered the sampling period shown. There was no known effluent to the river, but a massive tailings pile located at the river's edge remained from previous milling cycle and was added to during this period of operation. Liquid used to transport tailings may have seeped to the stream.

The mill at Uravan operated nearly continuously previous to and during the period covered by the data. Discharges to the river from this mill were effluents from their "Plant #5" process and from the yellow cake filter.

There is no appreciable addition to or decrease in flow of the San Miguel River between RMN 17 above Naturita and RMN 20 below Uravan. The differences in radium levels is readily visible among the stations.

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[1]Graphs and discussion of data in this paper include data presented herein and that reported previously in Data Release No. 1 and 2.

RADIUM MONITORING NETWORK

DATA RELEASE # 3

RADIUM 226 μμg/l vs. MONTH

RMN 17 ——
RMN 18 – –
RMN 20 – – –

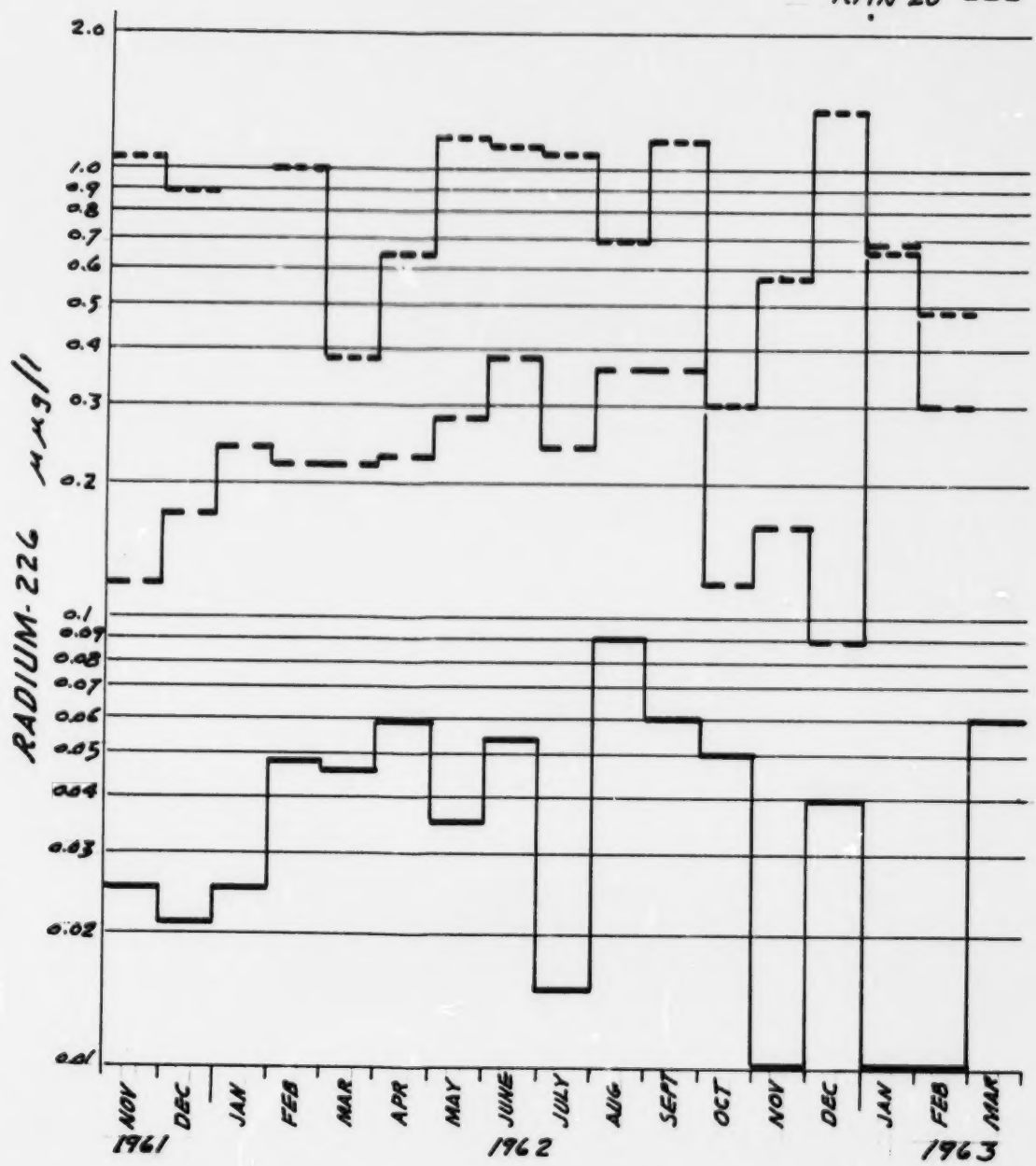


FIGURE 2

Overall Ra-226 data from these three stations yield the following:

RMN 17: San Miguel River above Naturita, Colorado

Average Ra-226	0.04 μμc/l
Range	0.00 to 0.09 μμc/l
Number of analyses	34

RMN 18: San Miguel River above Uravan

Average Ra-226	0.25 μμc/l
Range	0.03 to 1.2 μμc/l
Number of analyses	53

RMN 20: San Miguel River below Uravan, Colorado

Average Ra-226	0.90 μμc/l
Range	0.11 to 4.8 μμc/l
Number of analyses	51

Uranium data from the same stations are:

RMN 17:	Average uranium	1.3 μg/l
	Range	0.9 to 2.1 μg/l
	Number of analyses	6
RMN 18:	Average uranium	12 μg/l
	Range	3.0 to 63 μg/l
	Number of analyses	22
RMN 20:	Average uranium	35 μg/l
	Range	0.7 to 150 μg/l
	Number of analyses	22

The effects of the two uranium mills at Naturita and at Uranvan can be seen from the plots and the figures presented above.

Figure 3 shows the radium-226 concentration in the Dolores River at RMN-21, Dolores River at Bedrock, Colorado and RMN-26, Dolores River at Gateway, Colorado. The Dolores River above RMN-21 flows through uranium mining country and past the now abandoned Slick Rock uranium mill of Union Carbide Nuclear Company. There is a substantial tailing pile at this site. Between the two stations, the Dolores River flows through Paradox Valley, which contains large salt deposits, the San Miguel enters the Dolores and the river flows approximately 30 miles through canyon with intermittent streams entering from each side.

Data from stations RMN-21 and 26 show the following overall radium-226 results:

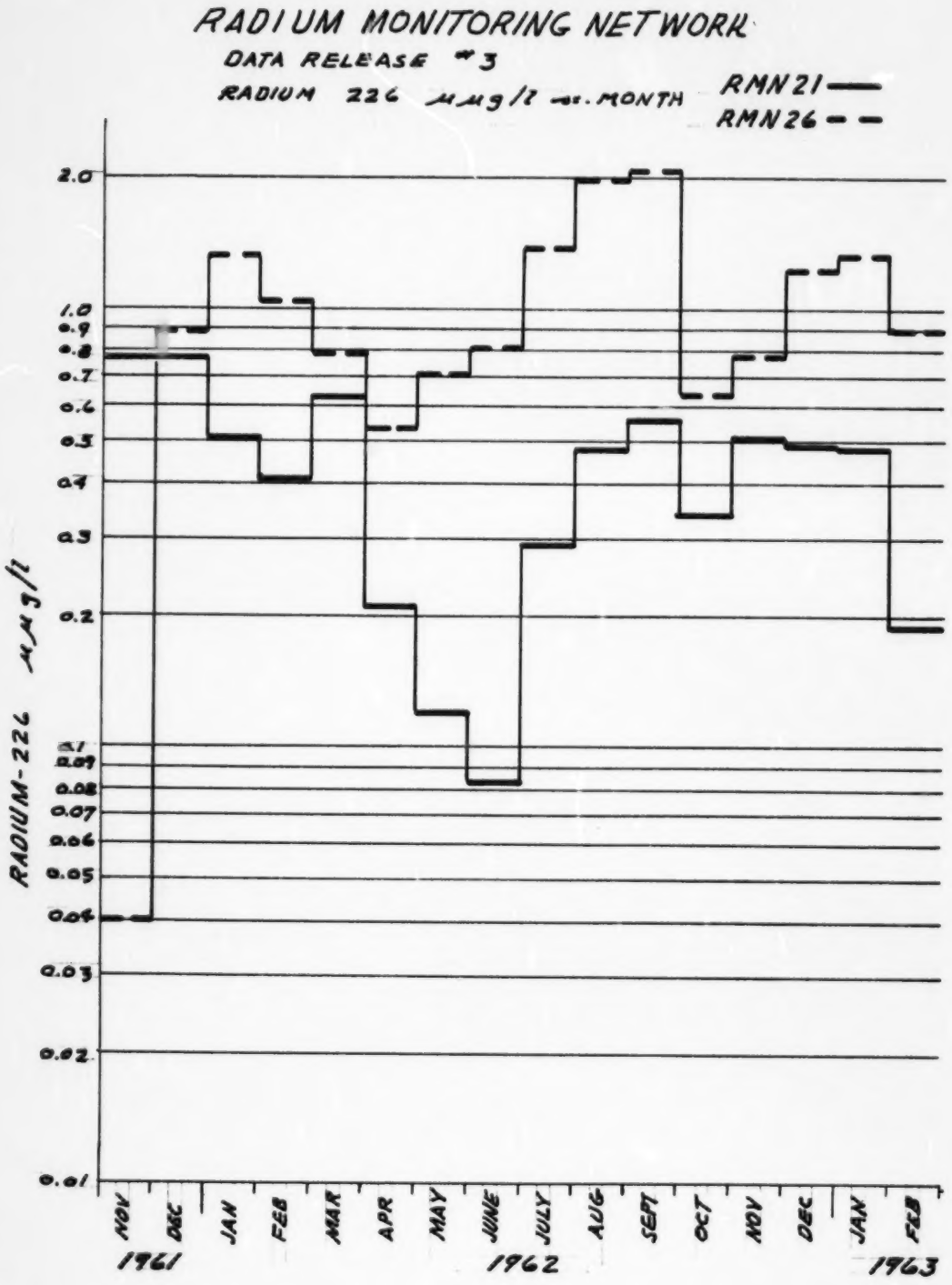

RADIUM MONITORING NETWORK
DATA RELEASE #3
RADIUM 226 μμg/l vs. MONTH
RMN21
RMN26
RADIUM-226 μμg/l
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
JAN
FEB
1961
1962
1963

FIGURE 3

RMN 21: Dolores River at Bedrock, Colorado

Average Ra-226	0.48 μμc/l
Range	0.08 to 1.0 μμc/l
Number of analyses	18

RMN 26 Dolores River at Gateway, Colorado

Average Ra-226	1.3 μμc/l
Range	0.04 to 3.3 μμc/l
Number of analyses	44

Uranium analyses on the same stations are as follows:

RMN 21:	Average uranium	10 μg/l
	Range	7.4 to 12 μg/l
	Number of analyses	5
RMN 26:	Average uranium	8.9 μg/l
	Range	1.3 to 24 μg/l
	Number of analyses	22

The difference in radium concentration is in part due to the entrance of the San Miguel River. Many of the side canyons and intermittent streams entering the Dolores originate in an area known for extensive uranium deposits which could add radioactive materials to the runoff waters.

Figure 4 includes RMN 6, RMN 9 and RMN 10, Colorado River near Fruita, Colorado, Colorado River above Moab, Utah, and Colorado River below Moab, Utah, respectively. Between RMN 6 and RMN 9, the Dolores River enters, exerting its influence on the Colorado. The Atlas Mineral Company [1] uranium mill is between RMN 9 and RMN 10.

The radium-226 data from RMN 6, RMN 9 and RMN 10 show the following:

RMN 6: Colorado River near Fruita, Colorado

Average Ra-226	0.16 μμc/l
Range	0.04 to 0.26 μμc/l
Number of analyses	15

RMN 9: Colorado River above Moab, Utah

Average Ra-226	0.26 μμc/l
Range	0.10 to 0.50 μμc/l
Number of analyses	39

[1]Previously the Uranium Reduction Company.

RADIUM MONITORING NETWORK
DATA RELEASE # 3

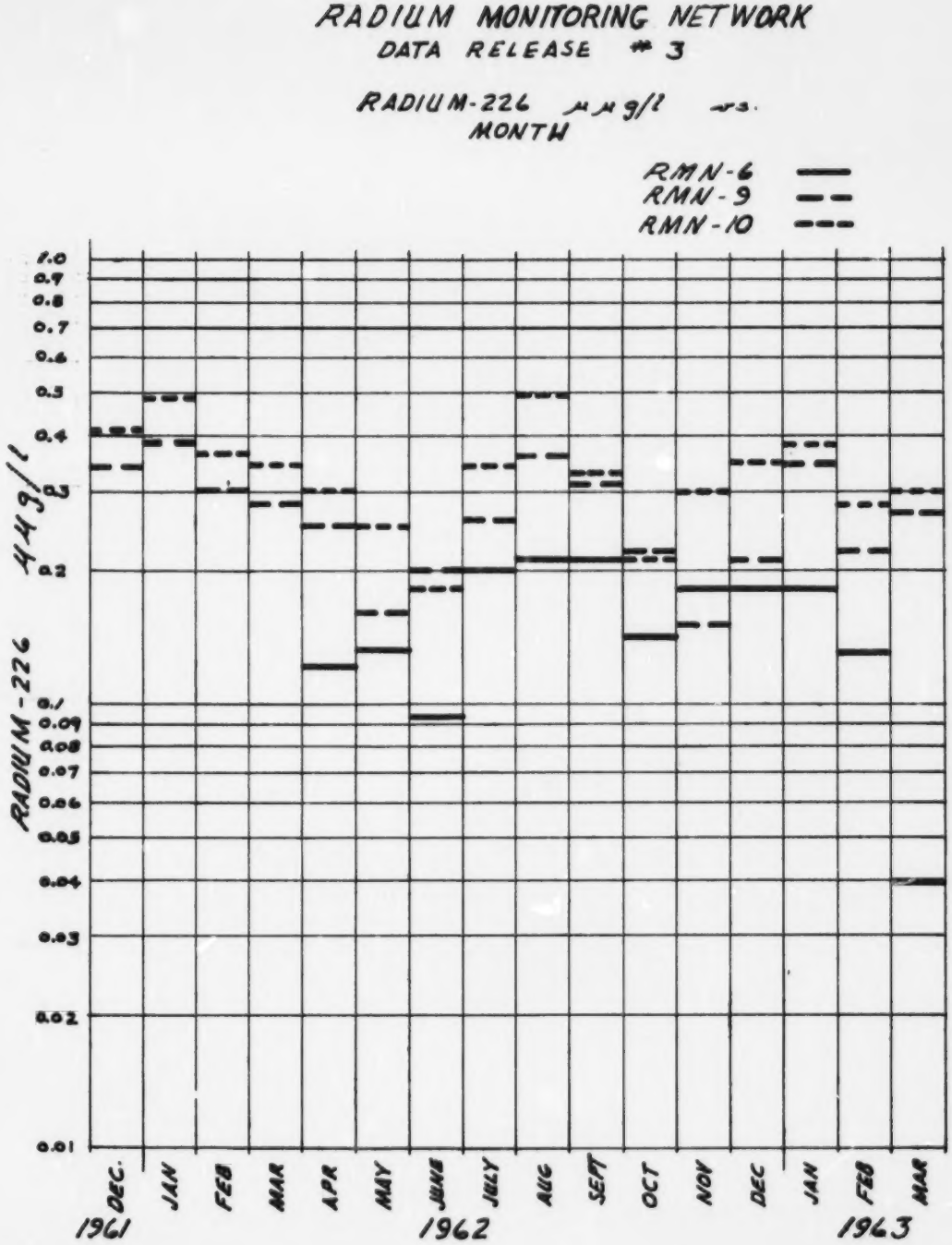


FIGURE 4

RMN 10: Colorado River below Moab, Utah

Average Ra-226	0.33 μμc/1
Range	0.18 to 0.49
Number of analyses	35

Uranium analysis data from the same stations show the following:

RMN 6:	Average uranium	9.1 μg/1
	Range	8.1 to 10 μg/1
	Number of analyses	6
RMN 9:	Average uranium	12 μg/1
	Range	8.7 to 31 μg/1
	Number of analyses	26
RMN 10:	Average uranium	13 μg/1
	Range	9.0 to 22 μg/1
	Number of analyses	22

Radium-226 concentrations at RMN 15, San Juan River above Mexican Hat, Utah and RMN 16, San Juan River below Mexican Hat are shown on Figure 5. Effluents from the Texas Zinc Co. uranium mill enter the San Juan River between these two stations.

Radium-226 data from these two stations yield the following:

RMN 15: San Juan River above Mexican Hat, Utah

Average Ra-226	0.14 μμc/1
Range	0.05 to 0.23 μμc/1
Number of analyses	19

RMN 16: San Juan River below Mexican Hat, Utah

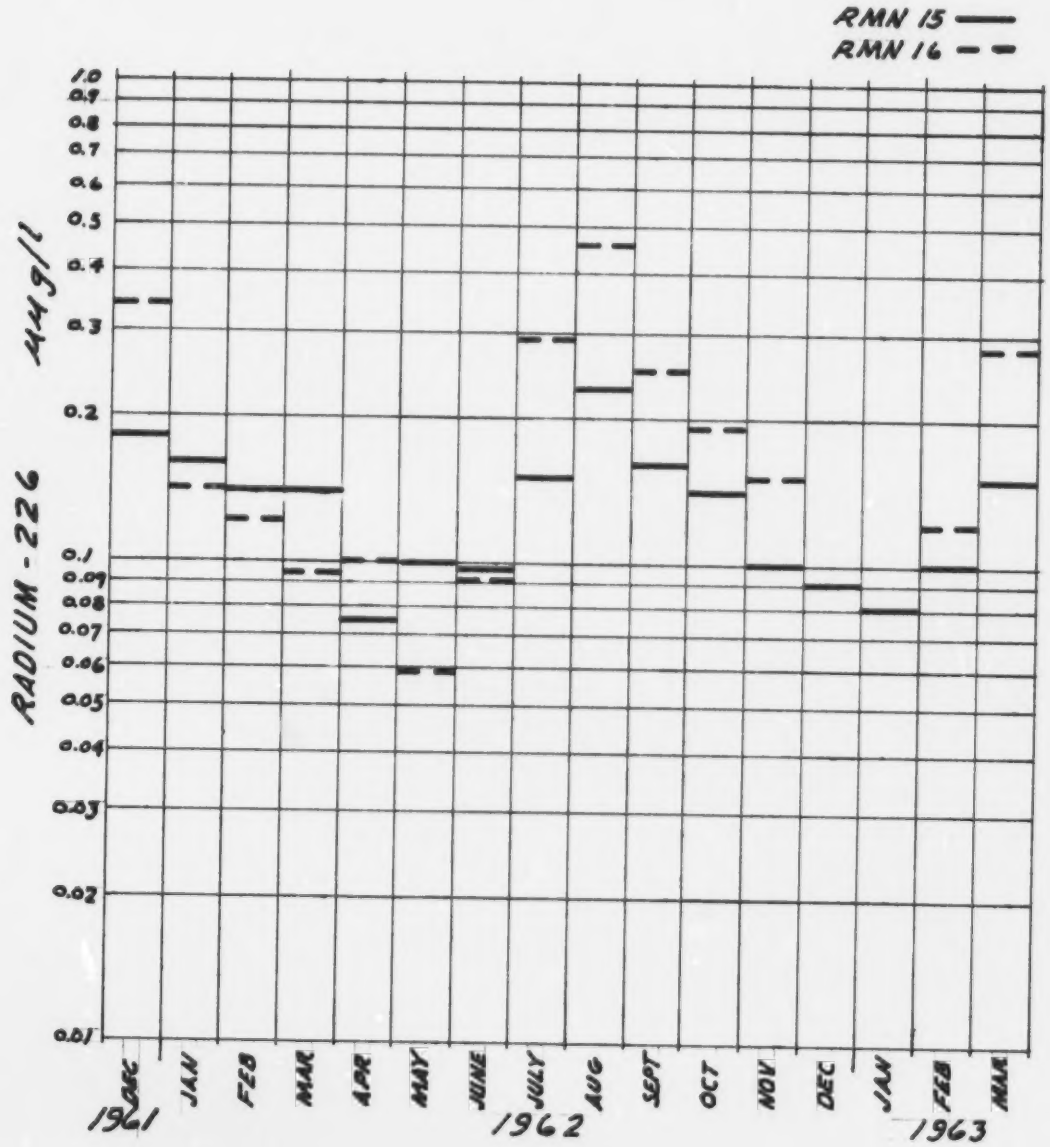
Average Ra-226	0.33 μμc/1
Range	0.06 to 2.45 μμc/1
Number of analyses	26

Data from uranium analyses is as follows:

RMN 15:	Average uranium	10 μg/1
	Range	8.7 to 13 μg/1
	Number of analyses	6
RMN 16:	Average uranium	9.5 μg/1
	Range	0.2 to 15 μg/1
	Number of analyses	6

RADIUM MONITORING NETWORK
DATA RELEASE #3

RADIUM-226 μμg/l vs MONTH



GPO 835-408

FIGURE 5

At only one station, RMN 26, Dolores River at Gateway, Colorado is the average of all radium-226 analyses to date over 1.0 μμc/l, at 1.3 μμc/l. At one other, RMN 20, San Miguel River below Uravan, Colorado, the average is 0.90 μμc/l.

The overall data presented here and in Data Release No. 1 and 2, show the effectiveness and merit of the Radium Monitoring Network in the Colorado River Basin.

The data reported for all stations in the Radium Monitoring Network since Data Release No. 2 of January 1963 is appended.

RMN Station 1: Colorado River at Silt, Colorado
Started : November 25, 1961
Type : Automatic Pump-timer

Date	Radium-226 μμc/liter	Uranium 238 μg/liter
1962		
Sept. 29-Nov. 3	0.18	3.3
Nov. 3-Dec. 1	0.19	3.2
Dec. 1-Dec. 29	0.25	3.6
1963		
Dec. 29-Feb. 2	0.26	3.1
Feb. 2-Mar. 2	0.28	3.0
Mar. 2-Mar. 30	0.23	3.9

RMN Station 4: Colorado River above DeBeque, Colorado
Started: November 12, 1961
Type: Automatic Pump-timer

Date	Radium-226 μμc/liter	Uranium 238 μg/liter
1962		
Sept. 29-Nov. 3	0.15	6.5
Nov. 3-Dec. 1	0.19	4.5
Dec. 1-Dec. 29	0.26	4.2
1963		
Dec. 29-Feb. 2	0.44	4.3
Feb. 2-Mar. 2	0.24	4.4
Mar. 3-Mar. 30	0.24	5.1

RMN Station 5: Gunnison River above Grand Junction, Colorado
Started: April 16, 1962
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium 238 μg/liter
1962		
Oct. 1-Nov. 3	0.05	12
Nov. 5-Dec. 1	0.04	13
Dec. 3-Dec. 29	0.07	13
1963		
Dec. 31-Feb. 2	0.04	13
Feb. 4-Mar. 2	0.01	10
Mar. 4-Mar. 30	0.18*	10

*To be rechecked.

RMN Station 6: Colorado River near Fruita, Colorado
Started: April 16, 1962
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 3	0.14	8.5
Nov. 5-Dec. 1	0.18	8.5
Dec. 3-Dec. 29	0.18	10
1963		
Dec. 31-Feb. 2	0.18	9.9
Feb. 4-Mar. 2	0.13	9.5
Mar. 5-Mar. 30	0.04*	8.1

*To be rechecked.

RMN Station 9: Colorado River above Moab, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
October 1-6	0.19	10
October 8-13	0.16	9.5
October 15-20	0.25	9.0
October 22-27	0.28	8.7
October 29-Nov. 3	0.20	9.2
November 5-10	0.13	8.9
November 12-17	0.10	11
November 19-24	0.19	9.5
November 26-Dec. 1	0.16	11
December 3-8	0.20	9.8
December 10-15	0.19	11
December 17-22	0.18	10
December 24-29	0.29	12
1963		
Dec. 31-Jan. 5	0.29	10
January 7-12	0.21	10
January 14-19	0.38	14
January 21-26	0.38	14
January 28-Feb. 2	0.50	31
February 4-9	0.20	11
February 11-16	0.24	11
February 18-23	0.23	12
Feb. 25-Mar. 2	0.20	11
March 4-9	0.24	11
March 11-16	0.21	10
March 18-23	0.30	15
March 25-30	0.34	13

RMN Station 10: Colorado River below Moab, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 3	0.21	9.0
November 5-10	0.33	11
November 12-17	0.30	11
November 19-24	0.30	12
November 26-Dec. 1	0.28	12
December 3-8	0.28	10
December 10-15	0.30	12
December 17-22	0.36	12
December 24-29	0.45	18
1963		
Dec. 31-Jan. 5	0.40	16
January 7-12	0.33	16
January 14-19	0.40	14
January 21-26	0.40	12
Jan. 28- Feb. 2	0.38	22
February 4-9	0.36	12
February 11-16	0.28	12
February 18-23	0.18	13
Feb. 25-Mar. 2	0.30	13
March 4-9	0.21	15
March 11-16	0.29	14
March 18-23	0.33	15
March 25-30	0.38	12

RMN Station 11: Animas River at Durango, Colorado
Started : July 17, 1961
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
October 1-30	0.06	1.0
November 5-30	0.03	1.8
December 3-28	0.06	0.6
1963		
Dec. 31-Feb. 1	0.05	1.2
February 4-27	0.08	2.1
March 6-29	0.08	1.2

RMN Station 12: Animas River at Colorado-New Mexico State Line
Started: January 19, 1961
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
October 1-8	0.24	8.5
October 8-15	0.33	8.9
October 15-22	0.14	6.0
October 22-29	0.14	6.1
Oct. 29-Nov. 5	0.18	8.3
November 5-12	0.25	9.1
December 3-10	0.68	7.1
December 10-17	0.34	8.8
December 17-24	0.46	5.6
December 24-31	1.51*	2.3
1963		
Dec. 31-Jan. 7	1.29*	2.9
Feb. 25	0.19	18
Feb. 27-Mar. 4	0.29	7.8
March 18	0.34	10
March 25	0.34	2.8

* To be rechecked.

RMN Station 13: San Juan River above Farmington, New Mexico
Started: July 9, 1962
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 15-Nov. 2	0.16	8.3
Nov. 5-Dec. 3	0.03	5.4
December 5-28	0.08	4.3
1963		
Dec. 31-Jan. 28	0.14	4.0
Feb. 4-Mar. 1	0.13	5.5
March 4-29	0.05	1.9

RMN Station 14: San Juan River at Fruitland, New Mexico
Started: August 1, 1962
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 8-Nov. 2	0.09	5.1
Nov. 5-Dec. 1	0.15	7
December 5-28	0.09	6.8
1963		
Dec. 31-Jan. 7	0.08	6.6
Feb. 4-Mar. 1	0.16	7.7
March 4-29	0.21	9.0

RMN Station 14S: San Juan River below Shiprock, New Mexico
Started: August 7, 1962
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 2	0.09	8.3
Nov. 5-Dec. 3	0.08	11
December 5-26	0.04	13
1963		
Dec. 31-Jan. 7	0.06	12
Feb. 4-Mar. 1	0.11	16
March 4-29	0.20	14

RMN Station 15: San Juan River above Mexican Hat, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 3	0.14	8.7
Nov. 5-Dec. 1	0.10	9.0
December 3-29	0.09	9.8
1963		
Dec. 31-Feb. 2	0.08	13
Feb. 4-Mar. 2	0.10	8.9
March 4-30	0.15	11

RMN Station 16: San Juan River below Mexican Hat, Utah
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 3	0.19	10
Nov. 5-Dec. 1	0.15	11
December 3-29	0.53*	9.0
1963		
Dec. 31-Feb. 2	2.45*	0.2
Feb. 4-Mar. 2	0.12	15.0
March 4-30	0.28	12.

*Samples taken too close to mill effluent. Not representative of river conditions.

RMN Station 17: San Miguel River above Naturita, Colorado
Started: October 28, 1961
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Sept. 29-Nov. 4	0.05	1.2
Nov. 4-Dec. 2	< 0.01	1.0
December 2-30	0.04	0.9
1963		
Dec. 30-Feb. 3	0.01	1.1
Feb. 3-Mar. 3	0.01	1.3
March 3-30	0.06	2.1

RMN Station 18: San Miguel River above Uravan, Colorado
Started: October 27, 1961
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Sept. 29-Oct. 7	0.21	5.6
October 7-13	0.16	5.5
October 13-19	0.08	5.8
October 19-27	0.06	3.0
Oct. 27-Nov. 4	0.11	4.7
November 4-12	0.11	6.1
November 12-19	0.34	6.7
November 19-25	0.05	5.9
November 25-Dec. 2	0.13	9.1
December 2-9	0.03	5.5
December 9-16	0.10	6.3
December 16-22	0.06	6.8
December 22-30	0.15	9.4
1963		
Dec. 30-Jan. 6	0.35	17
January 6-13	0.40	24
January 13-20	0.88	63
January 20-27	1.24	19
Jan. 27-Feb. 3	0.59	17
February 3-10	0.33	7.7
February 10-17	0.48	12
February 17-24	0.09	9.4
February 24-Mar. 3	0.30	8.7

RMN Station 20: San Miguel River below Uravan, Colorado
Started: October 9, 1961
Type: Automatic

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1961		
December 9-17	1.01)	Reported in RMN Data Release No. 1 as October dates
December 17-23	1.04)	
December 23-30	0.86)	
1962		
Sept. 29-Oct. 7	0.50	3.9
October 7-13	0.20	0.67
October 13-19	0.29	31
October 19-27	0.20	8.3
October 27-Nov. 4	0.29	8.7
November 4-12	0.60	60
November 12-19	0.51	5.3
November 19-25	1.10	13
November 25-Dec. 2	0.38	7.3
December 2-9	0.34	32
December 9-16	0.11	48
December 16-22	4.84 *	62
December 22-30	0.24	84
1963		
Dec. 30-Jan. 6	0.68	54
January 6-13	0.74	1.50
January 13-20	0.59	67
January 20-27	0.85	2.5
Jan. 27-Feb. 3	0.48	24
January 6-13	0.74	1.5
January 13-20	0.59	67
January 20-27	0.85	2.5
January 27-Feb. 3	0.48	24
February 3-10	1.13	4.4
February 10-17	2.50	52
February 17-24	1.54	24
Feb. 24-Marc. 3	0.81	29

*Results to be rechecked.

RMN Station 21: Dolores River at Bedrock, Colorado
Started: October 30, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
Oct. 1-Nov. 3	0.34	11
Nov. 5-Dec. 1	0.51	12
December 3-29	0.49	11
1963		
Dec. 31-Feb. 2	0.48	8.9
Feb. 4-Mar. 2	0.19	7.4

RMN Station 24: Gunnison River above Gunnison, Colorado
Started: December 11, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 3	0.05	1.3
Nov. 9-Dec. 1	0.04	1.2
December 3-29	0.06	1.9
1963		
Dec. 31-Feb. 2	0.05	2.6
Feb. 4-Mar. 2	0.04	1.2

RMN Station 25: Gunnison River below confluence of Tomichi Creek, Gunnison, Colorado
Started: December 5, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Apr. 30-June 2	0.01*	
Oct. 1-Nov. 3	0.04	3.0
Nov. 5-Dec. 1	0.05	2.3
December 3-29	0.06	2.6
1963		
Dec. 31-Feb. 2	0.09	3.2
Feb. 4-Mar. 2	0.03	3.2

*Amended 3/19/63 from 1.1 as reported RMN Data Release No. 2.

RMN Station 26: Dolores River at Gateway, Colorado
Started: December 26, 1961
Type: Six daily grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
October 1-6	0.60	16
October 8-13	0.81	2.2
October 15-20	0.71	15
October 22-27	0.48	17
October 29-Nov. 3	0.60	4.6
November 5-10	0.79	2.3
November 12-17	0.75	1.3
November 19-24	0.79	4.1
Nov. 26-Dec. 1	0.80	4.3
December 3-8	0.73	2.3
December 10-15	0.79	1.7
December 17-22	1.90	1.9
December 24-29	1.46	7.1
1963		
Dec. 31-Jan. 5	1.05	5.6
January 7-13	1.24	6.9
January 14-19	1.54	10
January 21-26	1.16	14
Jan. 28-Feb. 2	1.63	23
February 4-9	0.61	20
February 11-16	0.96	24
February 18-23	1.00	9.9
February 25-March 2	1.04	3.5

RMN Station 28: Yampa River below Maybell, Colorado
Started: July 2, 1962
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
Oct. 1-Nov. 2	0.06	2.4
November 5-30	0.10	2.3
December 3-28	0.10	2.0
1963		
Dec. 31-Feb. 1	0.10	2.8
Feb. 4-Mar. 2	0.08	4.9

RMN Station 29: Green River below Green River City, Utah
Started: July 16, 1962
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1962		
July 31-Aug. 31	0.08	--
September 3-29	0.05	--
Oct. 1-Nov. 2	0.06	6.0
November 4-30	0.05	7.3
December 3-29	0.06	6.2

RMN Station 30: Colorado River at U. S.-Mexican Border
Started: June 19, 1961
Type: Five grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
Oct. 2-Nov. 2	0.21	9.6
November 5-30	0.08	8.3
December 3-28	0.14	8.0

RMN Station 33: Metropolitan Water District Intake, Lake Havasu, California-Arizona
Started: January 7, 1963
Type: Three grab samples per week

Date	Radium-226 μμc/liter	Uranium-238 μg/liter
1963		
Jan. 7-Feb. 1	0.26	9.9
February 4-20	0.40	11.